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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/208,963	12/10/98	LIU	J 97-2739

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IM52/0510

EXAMINER

WILKINS III, H

ART UNIT

PAPER NUMBER

1742

13

DATE MAILED:

05/10/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

**Office Action Summary**

Application No.

09/208,963

Applicant(s)

LIU ET AL.

Examiner

Harry D Wilkins, III

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 March 2001.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. § 119**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

**Attachment(s)**

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 18) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. Claims 1-40 are pending.

***Continued Examination Under 37 CFR 1.114***

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5 March 2001 has been entered.

***Response to Amendment***

3. The declaration under 37 CFR 1.132 filed 5 March 2001, with the change of language from "comprising" to "consisting essentially of", is sufficient to overcome the rejection of claims 1-20 and 22-40 based upon Karabin et al under 35 U.S.C. 102, however, new grounds of rejection are as follows.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Karabin et al (US 5,863,359) in view of Colvin et al (US 5,213,639).

Karabin et al teach an aluminum alloy composition. Karabin et al's alloy consists of 3.6 to 4.0 wt% copper, 1.0 to 1.6 wt% magnesium, 0.3 to 0.7 wt% manganese, 0.05 to 0.25 wt% zirconium, and the balance aluminum and inevitable impurities. The alloy is restricted to less than 0.05 wt% iron and less than 0.03 wt% silicon. The alloy is subjected to a heat treatment in a temperature range of 900-935°F, which includes values below its  $T_{\max}$ . The alloy maintains the yield strength of 2324-T39, actually increasing it slightly. The alloy has properties among which  $\Delta K$  at a fatigue crack growth rate of 10  $\mu$ -inch/cycle increases above the baseline 2324-T39 alloy by more than 30% (see Table 1). Regarding the value of  $Cu_{\text{target}}$ , the composition of Karabin et al falls within the claimed composition, therefore it is inherent that it would satisfy the  $Cu_{\text{target}}$ .

The difference between the claimed invention and the teachings of Karabin et al is the inclusion of zirconium in the alloy of Karabin et al. The present claim states "consisting essentially of" which is accepted to be closed language except for elements that do not materially change the invention. Zirconium does materially change the present invention by preventing the recrystallization of the alloy as evidenced by the declaration filed by applicants on 5 March 2001.

Colvin et al teach an aluminum alloy which is substantially similar to that of the present invention in terms of composition (see abstract for composition). Colvin et al teach (see col 3, 24-32) that zirconium included in aluminum alloys causes an unrecrystallized product. Colvin et al also teach that if zirconium is contained at more

than 0.12 wt% then primary zirconium bearing particles might be formed in casting which can be detrimental to toughness.

Therefore, it would have been obvious to one of ordinary skill in the art to have removed the zirconium to create a recrystallized product as taught by Colvin et al from the invention of Karabin et al because the inclusion of zirconium could lead to a decrease in toughness as taught by Colvin et al (col 1, lines 24-32). It is well settled that omission of an element and its function where not needed is obvious. *Ex parte Rainu*, 168 USPQ 375 (PTO Bd. App. 1969) and *In re Karlson*, 136 USPQ 184 (CCPA 1963).

Regarding claim 2, Karabin et al teach (see abstract) an alloy composition that is within the limitations of W, X, Y, and Z on figure 5.

Regarding claim 3, Karabin et al teach (see abstract) composition ranges that overlap the instant claims, therefore it is inherent that the values of  $Cu_{target}$  and  $Mg_{target}$  are satisfied.

Regarding claims 4-8, Karabin et al teach (see col 8, table 1) a composition that increases  $\Delta K$  at a fatigue crack growth rate of 10 m-inch/cycle above the baseline 2324-T39 alloy by more than 30%.

Regarding claims 9-10 and 17-18, Karabin et al's composition (see abstract) is used for parts of a lower wing on an aircraft.

Regarding claims 11-16, Karabin et al teach (see abstract and col 8, table 1) a composition of claim 2, that increases  $\Delta K$  at a fatigue crack growth rate of 10 m-inch/cycle above the baseline 2324-T39 alloy by more than 30%.

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Regarding claims 19 and 20, it is inherent in the composition of Karabin et al. that if the silicon were reduced further in the disclosed amount that the  $T_{max}$  would be an increase of 1-5°F.

Regarding claims 20 and 21, Karabin et al do not mention what type of temper the alloy exists in. However, it is stated (see col 1, line 64 to col 2 line 5) that aluminum alloys that are similar to 2024 or 2324 are normally tempered using T3-type tempers, typically T351 or T39. Therefore, it would have been obvious to temper the alloy of Karabin et al using the T351 or T39 methods because it is merely a modified 2324 aluminum alloy.

Regarding claims 25, 28, 31, 34, 37 and 40, in table 1 Karabin et al show (see col 8, table 1) that  $\Delta K$  improves by 4.0 ksi/in<sup>2</sup> where R=0.1 and at a fatigue growth rate of 10  $\mu$ -inch/cycle.

Regarding claims 23, 26, 29, 32, 35 and 38, in table 1 Karabin et al show (see col 8, table 1) that  $K_{Ic}$  for the alloy improves by 6 ksi/in<sup>2</sup> over the 2324-T39 alloy.

Regarding claims 24, 27, 30, 33, 36 and 39, with respect to the property of increased  $K_{app}$  over the 2324-T39 alloy, the composition taught by Karabin et al overlaps the composition and teaches a similar method of production as recited in the claims, therefore, one of ordinary skill in the art would have expected that the products taught by the reference would inherently have the same  $K_{app}$  as claimed.

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**Conclusion**

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D Wilkins, III whose telephone number is 703-305-9927. The examiner can normally be reached on M-F 8:15am-4:45pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V King can be reached on 703-308-1146. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3599 for regular communications and 703-305-3599 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Harry D Wilkins, III  
Examiner  
Art Unit 1742

hdw  
May 8, 2001

ROY KING   
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700